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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/253,048	02/19/1999	YASUHITO INAGAKI	9792909-4094	5170
26263 7590 09/28/2010 SNR DENTON US LLP P.O. BOX 061080 WACKER DRIVE STATION, WILLIS TOWER CHICAGO, IL 60606-1080				
EXAMINER MARKOFF, ALEXANDER				
ART UNIT		PAPER NUMBER		
1711				
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09/28/2010		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

09/253,048

**Applicant(s)**

INAGAKI ET AL.

**Examiner**

Alexander Markoff

**Art Unit**

1711

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 September 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 42-48, 50, 51, 55 and 57 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 42-48, 50, 51, 55 and 57 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SE/C.3)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

## DETAILED ACTION

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/14/10 has been entered.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 42-48, 50, 51, 55 and 57 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The applicants amended the claims to recite specific ionic substituents. The recited substituents are selected from the group consisting of carboxylic acids, hydroxyl groups,  $\text{PO}(\text{OH})_2$ ,  $\text{CH}_2\text{PO}(\text{OH})_3$ ,  $\text{NO}_2$  and salts thereof.

The amendment makes the claims indefinite.

First, it is not clear how carboxylic acids or their salts can be a substituent. How can a compound be a substituent? The substituent is a part of the polymer, which has substituted another part of the polymer.

Same is true for  $\text{PO}(\text{OH})_2$  (phosphorous acid) and  $\text{NO}_2$  (nitrogen dioxide).

Further it is not clear what is referenced as salts of hydroxyl groups and salts of nitrogen dioxide.

Further, it is not clear what is referenced as  $\text{CH}_2\text{PO}(\text{OH})_3$  and salts thereof and how it can be a substituent in the polymer.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
7. Claims 42, 44, 48, 50, 51 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 55-157604 in view of JP 52—063189 and Sugo et al (US Patent NO 5,783,608).

JP 55-157604 teaches a method comprising providing an agent comprising a polymer as claimed, which is treated as claimed and using the agent for absorbing different substances.

The polymer is disclosed as acrylonitrile-styrene copolymer with concentration of acrylonitrile in the claimed range (20-30%).

The polymer is treated with sulfuric acid to hydrolyze acrylonitrile units and sulfonate the styrene units.

JP 55-157604 teaches the use of the agent for absorbing odor-emitting substances, as an absorbent agent, as useful for sanitary goods, etc.

JP 55-157604 does not specifically teach the use of the agent for absorbing ammonia or heavy metals.

However, JP 52-063189 and Sugo et al teach that it was known to use similar polymers, which were similarly functionalized polymers for absorbing heavy and radioactive metals and ammonia. See entire documents, especially abstract of the JP document, and abstract and column 6, line 60 - column 7, line 6 of Sugo et al.

The documents teach absorption from liquids and gasses.

It would have been obvious to an ordinary artisan at the time the invention was made to use the agent of JP 55-157604 for absorption of ammonia and/or heavy metals from liquids or gases with reasonable expectation of adequate results because JP 52-063189 and Sugo et al teach that it was known to use similar polymers, which were similarly functionalized polymers for absorbing heavy and radioactive metals and ammonia.

8. Claims 45-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 55-157604 in view of JP 52—063189 and Sugo et al, further in view of Grant et al (US Patent NO 5,242,503).

JP 55-157604 in view of JP 52—063189 and Sugo et al does not specifically teach application of the cleaning agent to a solid soil material.

However, Grant et al teach removal contamination as claimed from the solid soil with ion exchange resins.

It would have been obvious to an ordinary artisan at the time the invention was made to use functionalized resins of the JP 55-157604 in the method of Grant et al with reasonable expectation of adequate results because JP 52—063189 and Sugo et al teach that it was known to use the resin, which are similarly functionalized as the resins of JP 55-157604 for removal the same contaminants as recited by Grant et al.

9. Claims 43 and 57 rejected under 35 U.S.C. 103(a) as being unpatentable over JP 55-157604 in view of JP 52—063189 and Sugo et al, further in view of Rodman (US Patent No 3,375,933).

JP 55-157604 modified JP 52—063189 and Sugo et al does not specifically teach the use of a column to facilitate the contact of the agent with the waste water and molding of the functionalized resin with a plastic.

Rodman teaches that it was known in the art to mold the exchange resins with plastic to improve efficiency of the resins.

Rodman also shows a column as a conventional way to contact the fluid to be cleaned with a cleansing agent.

See entire document, especially columns 1 and 2, column 3, lines 15-31, column 4, line 73 – column 5, line 15, Table 1, Figure 3 and the related description.

It would have been obvious to an ordinary artisan at the time the invention was made to employ the conventional means disclosed by Rodman in the method of JP 55-157604 modified by JP 52—063189 and Sugo et al for their primary purpose to contact the water or gas to be cleaned with the cleansing agent with reasonable expectation of success.

It would have also be obvious to an ordinary artisan at the time the invention was made to mold the exchange resin with a plastic as suggested by Rodman in the modified method of JP 55-157604 Rodman teaches that such would increase the efficiency of the cleaning.

***Response to Arguments***

10. Applicant's arguments filed 9/14/10 have been fully considered but they are not persuasive.

The applicants amended the claims and allege that JP 55-157604 does not teach the addition of an ionic substituent selected from the group consisting of carboxylic acids, hydroxyl groups,  $\text{PO}(\text{OH})_2$ ,  $\text{CH}_2\text{PO}(\text{OH})_3$ ,  $\text{NO}_2$  and salts thereof.

This is not persuasive because whether or not the applicants are correct in the allegation, the claims are not limited to necessarily require the argued limitation. The claims require treating the polymer with an acid and/or an alkali to convert via hydrolysis the acrylonitrile into hydrophilic substituents and/or introduce an ionic substituent into the polymer. Since the requirement of converting of acrylonitrile via hydrolysis and the requirement of introducing an ionic substituent are claimed in alternative, the claims do not necessarily require the argued limitation. The step of introducing of an ionic substituent is claimed as an optional step, which may or may not be present.

Since the JP document teaches converting acrylonitrile via hydrolysis by the same acid as recited by the claims the rejection is proper.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Markoff whose telephone number is 571-272-1304. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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